

Festuca diclina (Poaceae), a New Species from Northwestern Mexico

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ABSTRACT. A series of collections from Guadalupe y Calvo in southern Chihuahua State, Mexico, is described as a new species, *Festuca diclina* (Poaceae), and compared with similar species from Central America.

Festuca diclina S. J. Darbyshire, sp. nov. TYPE: Mexico. Chihuahua: Mpio. Guadalupe y Calvo, Cerro de Mohinora, S de Guadalupe y Calvo, 3300 m, alpina-subalpina, en ladera rocosa, 27 Aug. 1987, McDonald & Martinez 2392 (holotype, DAO 661232; isotypes, TEX (ex DAO 591464), MEXU (ex DAO 592610)). Figure 1.

Plantae perennes caespitosae, innovationibus intravaginalibus praeditae. Vaginae foliorum ima basi tantum integrae, vertice scabrae; ligulae 0.2–0.5 mm longae; laminae foliorum plicatae vel convolutae, 1.2–1.5 mm latae, abaxialiter ima basi scabrae, adaxialiter sparsim scabrae, 5–7-costatae, fasciculis sclerenchymaticis cum nervis infra et saepe supra conjunctis, non confluentibus. Culmi 30–75 cm longi, glabri. Paniculae 8–15 cm longae, plus minusve laxae, pyramidales, axe et ramulis glabris vel trichomatibus sparsis, ramulis interdum tortuosis. Spiculae 8–12 mm longae, (2–)3–4(–5) flosculis; glumae inferiores 2.4–4 mm longae, 1-nerviae; glumae superiores 3.5–5 mm longae, (1–)3-nerviae; rachillae trichomatibus 0.1–0.3 mm longae praeditae; lemmata lanceolata, glabra vel apice scabra, 1–3(–5)-nervia, 6–8 mm longa, interdum arista ad 1.0 mm longa; paleae 5.5–7 mm longae, bidentatae, apice piloso-hirsutae inter nervos, nervis cum trichomatibus 0.1–0.2 mm longis prope apicem; antherae interdum abortivae praesertim flosculis inferioribus, 3–4.2 mm longae; ovariorum apex dense pubescens.

Caespitose, loosely tufted perennial (Fig. 1A); shoots intravaginal. Vegetative shoots to 25 cm tall, light green (not glaucous); sheaths rapidly decaying to fibers, the margins closed only at the base, the upper parts of the sheaths, collars, and lower abaxial blade surface retrorsely scabrous; auricles absent; ligules short, 0.2–0.5 mm long, acute to truncate, sometimes lacerate, puberulent apically and abaxially, membranous; blades plicate to convolute, adaxially sparsely scabrous, 1.2–1.5 mm wide on flattened blades (about 0.4–0.8 mm in the longest dimension of a cross section), with 7(–9) veins and 5–7 adaxial ribs; sclerenchyma in discrete fascicles opposite veins abaxially and usually adaxially (Fig.

2A–C), the fascicles usually joining veins abaxially and sometimes adaxially thus forming a girder between the epidermises through the veins (Fig. 2A). Culms 30–75 cm tall, glabrous; nodes black or brown, glabrous. Flag leaf sheath sometimes loose. Panicle open, pyramidal, 8–15 cm long; rachis glabrous below and sparsely scabrous on the angles above; branches \pm flexuous and sometimes sinuously undulating, 1 or 2 per node, glabrous or sparsely scabrous, the lowest 5–9 cm long. Spikelets 8–12 mm long, distal on the branches, with (2–)3–4(–5) florets; glumes chartaceous, glabrous or scabrous on the keel (especially apically), ovate-lanceolate to lanceolate with wide hyaline margins; lower glume 2.4–4 mm long, 1-nerved; upper glume 3.5–5 mm long, (1–)3-nerved; rachilla with hairs 0.1–0.3 mm long (Fig. 1C); lemmas 6–8 mm long, narrowly lanceolate (Fig. 1B), glabrous or scabrous-hirsute apically, 1–3(–5)-nerved (the lateral ones faint), the apex attenuate, sometimes with a terminal awn or mucro to 1.0 mm long; paleas subequal to the lemmas, 5.5–7 mm long, bidentate, apically pilose-hirsute between the nerves and with hairs 0.1–0.2 mm long on the nerves (Fig. 1D, E); anthers sometimes abortive especially in lower florets, 3–4.2 mm long when developed; ovary apex densely pubescent (Fig. 1F); styles 2. Caryopses not seen.

Specimen label data from the type collection describe the culms as up to 2 m high, although all specimens examined were much less.

Distribution. Collections of *Festuca diclina* are known only from the vicinity of Guadalupe y Calvo, Sierra Madre Occidental, Mexico, in montane pine forests at altitudes of 2950–3300 m.

Festuca diclina belongs to *Festuca* subg. *Festuca* and is similar to *F. hintoniana* E. B. Alexeev (Figs. 1G–K, 2D) but differs primarily in the loose tufts with non-persistent sheaths decaying to separate fibers (densely tufted with persistent chartaceous sheaths in *F. hintoniana*), scabrous upper sheaths, collars, and lower leaf blades (not glabrous), narrower leaf blades (1.6–1.9 mm on flattened blades and 0.7–1.0 mm in longest dimension of transverse section in *F. hintoniana*), blade sclerenchyma in discrete fascicles (more or less continuous abaxial



A



G



B



C



D



E



F



H






I



J



K

Figures A, G  1 cm
 Figures B, D, H, J  1 mm
 Figures C, E, F, I, K  1 mm

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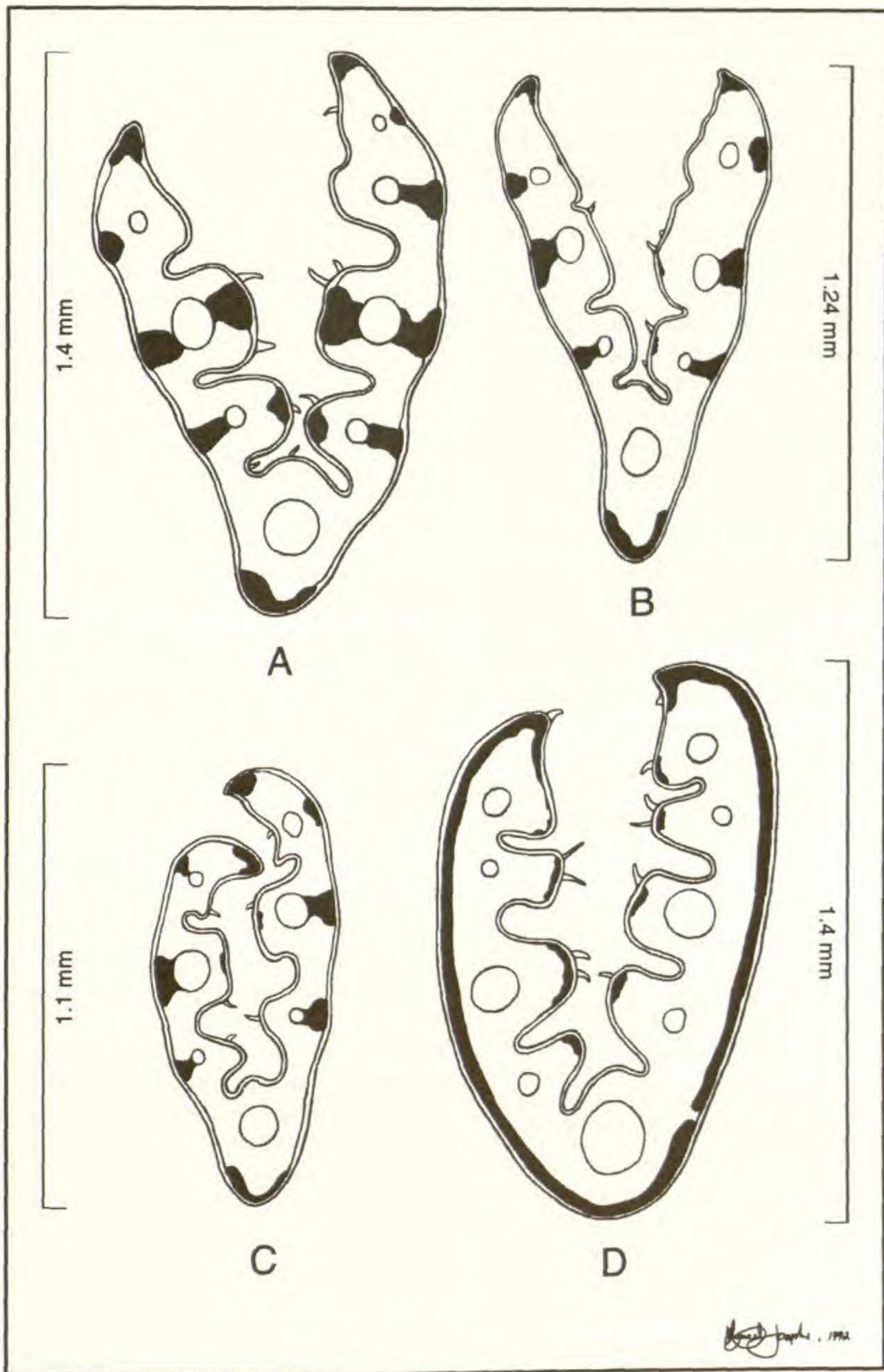


Figure 2. Camera lucida drawings of cross sections of mature leaves from vegetative shoots. —A–C. *Festuca diclina* S. J. Darbyshire. —D. *F. hintoniana* E. B. Alexeev. (A based on McDonald & Martinez 2392 (TEX), B based on McDonald & Nesom 2475 (ARIZ 285274), C based on Nesom & McDonald 6473 (ARIZ 281336), D based on Hinton 17243 (K).)

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Figure 1. *Festuca* species. A–F. *F. diclina* S. J. Darbyshire. —A. Habit. —B. Lower floret. —C. Rachilla. —D. Palea. —E. Palea apex. —F. Ovary. G–K. *F. hintoniana* E. B. Alexeev. —G. Habit. —H. Lower floret. —I. Rachilla. —J. Palea. —K. Palea apex. (A composite, B–F based on McDonald & Nesom 2489 (DAO 592613), G–K based on Hinton 17243 (K).)

band in *F. hintoniana*; Fig. 2D), which extend inward to meet vascular bundles, sclerenchyma fascicles of the blades visible from the abaxial surface (invisible or very faint in *F. hintoniana*), longer rachilla hairs (0.05–0.07 mm in *F. hintoniana*; Fig. 1I), longer hairs on the palea veins (scabrous prickles 0.02–0.05 mm in *F. hintoniana*; Fig. 1K) and pilose-hirsute apically between the palea veins (glabrous in *F. hintoniana*). The Mexican species *F. coahuilana* González-Ledesma & S. D. Koch is distinguished from *F. diclina* by the longer ligules (to 1 mm), which form erect auricular projections, wider leaf blades (1.5–2.2 mm) with 8–11 nerves, erect inflorescence branches, shorter lemmas (5.0–6.2 mm), and shorter anthers (2.5–2.7 mm). Two taxa recently described from Costa Rica, *F. herrerae* Davidse and *F. talamancensis* Davidse, are both readily distinguished from *F. diclina* by their glabrous ovaries and shorter anthers (less than 2.1 mm long). *Festuca diclina* is known from the Sierra Madre Occidental of northwestern Mexico, while both *F. hintoniana* and *F. coahuilana* are known only from the Sierra Madre Oriental in northeastern Mexico.

This species is so named because the lower florets within a spikelet frequently contain abortive anthers,

while the upper florets frequently contain apparently abortive ovaries.

Paratypes. MEXICO. **Chihuahua:** Mpio. Guadalupe y Calvo, NW side of Cerro Mohinora, ca. 13 mi. SW of Guadalupe y Calvo, 25°57'N, 107°03'W, open pine-fir woods with scattered spruce, top and near top of summit, open rocky slopes at lip of precipice with scattered krumholz [sic] pines, 3250 m, 21 Aug. 1988, *McDonald & Nesom 2489* (ARIZ 285277, DAO 592612, 592613); NW side of Cerro Mohinora, ca. 13 mi. SW of Guadalupe y Calvo, 25°57'N, 107°03'W, open pine-fir woods with scattered spruce, top and near top of summit, open rocky slopes at lip of precipice with scattered krumholz pines, 3250 m, 21 Aug. 1988, *McDonald & Nesom 2475* (ARIZ 285274, DAO 592611); N side of Cerro Mohinora, ca. 13 mi. SW of Guadalupe y Calvo, 25°57'N, 107°03'W, open pine-fir woods with scattered spruce, nearly vertical N-facing rock wall, very moist with many bryophytes and rich herbaceous flora, 2950 m, 20 Aug. 1988, *Nesom & McDonald 6473* (ARIZ 281336, TEX).

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